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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,772	02/24/2004	Moon-Sook Lee	8947-000075/US	8340

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HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 8910
RESTON, VA 20195

EXAMINER

LUND, JEFFRIE ROBERT

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 06/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/784,772

Applicant(s)

LEE ET AL.

Examiner

Jeffrie R. Lund

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 31-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/05.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-30, in the reply filed on March 15, 2006 is acknowledged. The traversal is on the ground(s) that there is no serious burden on the Examiner because of computer searching. This is not found persuasive because although electronic searching does allow searching of large numbers of patents, the more references searched, the more time required to make the search, which is a serious burden. Furthermore, apparatus and method claims require different considerations. For example, a limit that makes a method allowable may only be an intended use of the apparatus, or case law that is appropriate to a method claim is not appropriate for an apparatus and vice versa.

The requirement is still deemed proper and is therefore made FINAL.

Specification

2. A substitute specification excluding the claims is required pursuant to 37 CFR 1.125(a) because the specification uses the term "heat pipe" through the specification. Any amendment trying to correct the term "heat pipe" as required below, would result in replacing at least 18 of the 60 paragraphs of the specification and the abstract. Therefore, correcting the term "heat pipe" with a substitute specification is proper.

A substitute specification must not contain new matter. The substitute specification must be submitted with markings showing all the changes relative to the immediate prior version of the specification of record. The text of any added subject matter must be shown by underlining the added text. The text of any deleted matter

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must be shown by strike-through except that double brackets placed before and after the deleted characters may be used to show deletion of five or fewer consecutive characters. The text of any deleted subject matter must be shown by being placed within double brackets if strike-through cannot be easily perceived. An accompanying clean version (without markings) and a statement that the substitute specification contains no new matter must also be supplied. Numbering the paragraphs of the specification of record is not considered a change that must be shown.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-30 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a "heating pipe" or "heated pipe", does not reasonably provide enablement for a "heat pipe". The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. The term "heat pipe" refers to a closed heat transfer device that includes a working fluid and wicking structures that transfers heat through evaporation and condensation of the working fluid through wicking or capillary action (See for example Kelsey et al, US Patent 5,894,887). A heat pipe cannot be connected to a gas source and a showerhead, at best, could be formed around a conduit and used to heat the conduit. The specification and drawings do not disclose any heat pipes or any way a heat pipe might be used with conduit to

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transfer gas from a gas source to the showerhead.

The Examiner believes that the applicant is actually claiming a pipe that is used to preheat a gas as the gas flows through the pipe. The pipe is heated by the radiant energy from the heated parts of the processing apparatus, and thus cools the radiantly heated parts of the apparatus. The Examiner believes that a pipe embedded in the wall (figures 2 and 3) or along the inner wall (figures 4-7) is fully disclosed in the specification and drawings. This rejection would be overcome if the term "heat pipe" were amended to "heating pipe", "heated pipe", or "hot pipe" in the specification.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 2-10, 12, 13, 15-17, 20-30 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "heat pipe" in claims 2-10, 15, 17, and 20-30 is used by the claim to mean "a heated pipe that heats a gas as the gas flows through the pipe" or "a heating pipe that heats a gas as the gas flows through the pipe", while the accepted meaning is "a closed heat transfer device that includes a working fluid and wicking structures that

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transfers heat through evaporation and condensation of the working fluid through wicking or capillary action (See for example Kelsey et al, US Patent 5,894,887).” The term is indefinite because the specification does not clearly redefine the term. This rejection would be overcome if the term “heat pipe” were amended to “heating pipe”, “heated pipe”, or “hot pipe” in the claims.

Claims 7 and 9 are indefinite in that they require that the heat pipe require “a third heat part” without identifying a second heat part. The second heat part must be claimed before the third heat part can be claimed. The Examiner recommends changing the dependency of claims 7 and 9 from claim 3 to claim 6.

Claims 12, 13, 16, and 17 are indefinite because the claims are directed to an apparatus and include limitations that are methods of using the apparatus (i.e. using the apparatus to perform a MOCVD method (claim 12); flowing the first gas into the processing chamber at room temperature and flowing a heated metal organic gas into the processing chamber (claim 13); depositing a ferroelectric layer (claim 16); or supplying oxygen, Pb source, Zr source, or Ti source (claim 17)). As a result of the combination of two separate statutory classes of invention, a manufacturer or seller of the claimed apparatus would not know from the claim whether it might also be liable for contributory infringement because a buyer or user of the apparatus later performs the claimed methods of using the apparatus. Thus, such a claim is not sufficiently precise to provide competitors with an accurate determination of the metes and bounds of protection involved. (See *IPXL Holdings LLC v. Amazon.com Inc.* 77 USPQ2D 1140)

Claim 13 is indefinite in that it requires that the first source gas be flowed into the

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process chamber at room temperature, while claim 1, from which it depends requires that the heating device heat the first gas. Thus, it is not possible to heat the first gas and to supply the first gas at room temperature.

Claims 23, 24, 26, 27, 29 and 30 are indefinite in that it is not clear what a "two-dimensional shape" or a "three-dimensional shape" means because we live in a three-dimensional world and all objects have three-dimensional shapes and two-dimensional shapes are not possible. For examination, it has been assumed that a two-dimensional shape is like a planar coil and a three-dimensional shape is a helical coil. If this is correct the claims must be amended to clearly claim the shape. The Examiner further notes that if such an interpretation is made, Claims 24, 27, and 30 all specify a linear shape which is neither a two-dimensional shape or a three dimensional shape. Thus, claims 24, 27, and 30 would still be indefinite.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-5, 7-12, 14, and 16-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Sakamoto et al, US Patent 5,968,593.

Sakamoto et al teaches an apparatus for fabricating a semiconductor device that includes: a process chamber 100; a susceptor (wafer 200 on boat 212) disposed within the process chamber; a shower part 32, 40, and 42 disposed to face the susceptor; a first supply pipe 321 for supplying a first gas; a second supply pipe 322 supplying a second gas; a heating pipe 311 for heating the first gas; a second heating pipe 312 for heating a second gas; and a liner 10 between the heating pipe and the susceptor. The heating pipes are: connected with the supply pipes and the shower part; is inside the processing chamber 100; includes a helically coiled shaped part coiled around the circumference of the susceptor from the a lower portion of the sidewall to the upper portion of the sidewall of the process chamber; a second linear part (pipe connecting the first part with the helical coil); and a third spiral part disposed at an upper portion of the process chamber and connected with the shower part with an increasing radius from the central portion to the outer portion. The specific material deposited and process performed is an intended use of the apparatus, and Sakamoto et al is capable of depositing a ferroelectric layer, or a layer containing Pb, Zr, or Ti and functioning as a MOCVD apparatus. (Entire document, specifically, figure 13)

9. Claims 1-3, 10, 14, 16, 18-20, and 22-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Inokuchi et al, US Patent 6,139,641.

Inokuchi et al teaches an apparatus for fabricating a semiconductor device that includes: a process chamber 10; a susceptor 22 disposed within the process chamber; a shower part 28 disposed to face the susceptor; and a first supply pipe 44 for supplying a first gas; a heating pipe 42, 401, and 43 for heating the first gas. The heating pipe is:

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connected with the supply pipe and the shower part; includes a coiled shaped part 401 coiled around the circumference of the susceptor; a second linear part 42 connected to the gas inlet; and a third linear part 43 connected to the shower part. The specific material deposited is an intended use of the apparatus, and Inokuchi et al is capable of depositing a ferroelectric layer. (Entire document, specifically, the figures)

10. Claims 1, 11, 12, 14, 16-20, and 23-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Vaartstra et al, US Patent Application Publication 2001/0020448 A1.

Vaartstra et al teaches an MOCVD apparatus for fabricating a semiconductor device by depositing materials such as a ferroelectric material that includes: a process chamber 14; a susceptor 15 disposed within the process chamber; a shower part 50 disposed to face the susceptor; a first supply pipe for supplying an oxygen gas; a second gas supply pipe 45 supplying a gas containing Ti; and a heating pipe 44 and 46 for heating the oxygen gas. The heating pipe is connected with the supply pipe and the shower part; and includes a first linear part 44 and a second linear part 46. (Entire document, specifically, the figures)

11. Claims 1, 11, 12, 14, 16-20, and 23-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Derderian et al, US Patent Application Publication 2002/0188376 A1.

Derderian et al teaches an apparatus for fabricating a semiconductor device that includes: a process chamber 112; a susceptor 114 disposed within the process chamber; a shower part 126 disposed to face the susceptor; a first supply pipe 133A for

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supplying an oxygen gas; a second gas supply pipe 133b supplying a Ti gas; a heating pipe 134A for heating the first gas. The heating pipe is connected with the supply pipe and the shower part; and includes a first linear part 134 and a second linear part 137.

(Entire document, specifically, the figures)

12. Claims 1, 14, 16, 18-21, 23, and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Shim et al, US Patent Application Publication 2003/0041804 A1.

Shim et al teaches an apparatus for fabricating a semiconductor device that includes: a process chamber 110; a susceptor 120 disposed within the process chamber; a shower part 135 disposed to face the susceptor; and a first supply pipe (gas inlet) for supplying a first gas; a heating pipe 130 for heating the first gas. The heating pipe includes a first linear part 130 connected to the gas inlet and shower device; and is imbedded in the chamber wall or located inside the chamber wall. The specific material deposited is an intended use of the apparatus, and Shim et al is capable of depositing a ferroelectric layer. (Entire document, specifically, figure 2A, 2B)

13. Claims 1, 11, 12, 14, 15, 18-20, and 23-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Shinriki et al, US Patent 6,800,139 B1.

Shinriki et al teaches an MOCVD apparatus for fabricating a semiconductor device that includes: a process chamber 4; a susceptor 18 disposed within the process chamber; a shower part 50 disposed to face the susceptor; a first supply pipe; a second gas supply pipe 80 connected to the shower part; a heating pipe 62, 66, 68 for heating the first gas. The heating pipe includes a first linear part 68, a second linear part 62, and a third linear part 66. The shower part is divided into a first inlet part 56A, 56B into

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which the first gas flows, and a second inlet part 58A, 58B into which the second gas flows. (Entire document, specifically, figure 3)

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 2-13, 17, 22, and 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shim et al, US Patent Application Publication 2003/0041804 A1, in view of Sakamoto et al, US Patent 5,968,593.

Shim et al was discussed above.

Shim et al differs from the present invention in that Shim et al does not teach that the heating pipe coils in a helix or spiral coil along the bottom, sidewall, and top of the processing chamber, a liner between the susceptor and the heating pipe; a second gas inlet, specific gases supplied to the process chamber, or the specific method performed by the apparatus.

Sakamoto et al was discussed above and includes a heating pipe along the sidewall and top of the processing chamber in the form of a helical and spiral coil, a liner between the susceptor and heating pipe, and a second gas inlet.

The motivation for forming coils along the sides of the processing chamber is to extend the length of the heating pipe to extend the time in which the gas is preheated which results in the gas being heated to a more uniform temperature as taught by

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Sakamoto et al.

The motivation for adding the liner of Sakamoto et al between the susceptor and the gas inlet of Shim et al is to remove the heating pipe from the processing chamber environment as taught by Sakamoto et al.

The motivation for adding the second gas inlet of Sakamoto et al to the apparatus of Shim et al is to provide a second gas to the processing chamber.

The motivation for supplying the desired gases to the apparatus of Shim et al according to a desired method is to deposit the desired layer on the substrate.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made modify the apparatus of Shim et al to make the heating pipe with helical and spiral coils, add a liner, a second gas inlet as taught by Sakamoto et al; and to supply the desired gases to deposit the desired material using the desired method.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art teaches the technological background of the invention. The cited art contains patents that could be used to reject the claims under 35 USC § 102 or 103. These rejections have not been made because they do not provide any additional or different teachings, and if they were applied, would have resulted in an undue multiplication of references. (See MPEP 707.07(g))

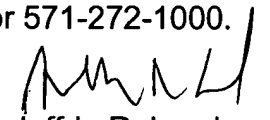
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-

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1437. The examiner can normally be reached on Monday-Thursday (6:30 am-6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Jeffrie R. Lund
Primary Examiner
Art Unit 1763

JRL
6/4/06